

CABLINE®-CAL

Part No. Plug : 20728-0**T-01, Receptacle : 20729-0**E-0#

Test Report

Product Specification no. PRS-2371

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Rev.	ECN	Date	Prepared by	Checked by	Approved by

CABLINE-CAL Test Report

1. Purpose

CABLINE-CAL コネクタの性能を PRS-2371 に基づいて評価する。

To evaluate the performance of CABLINE-CAL Connector in accordance with PRS-2371.

2. Specimen

(1) CABLINE-CAL PLUG ASS'Y (Part No. 20728-0**T-01)

(2) CABLINE-CAL RECEPTACLE ASS'Y (Part No. 20729-0**E-0#)

3. Test Sequence

全ての評価は表 1 の試験順序に従って行った。

All the evaluations were performed in accordance with Table 1. Test Sequence.

4. Result

表 2-1～2-4、グラフ 1～18 参照。試験条件の詳細は PRS-2371 参照。n 数は測定データを意味する。

See Table 2-1 to 2-4, Graph 1 to 18. For the details of the testing conditions and requirements, see PRS-2371.

The “n” in the tables show the number of measurement points.

5. Conclusion

全ての資料が製品規格（PRS-2371）の必要条件を満足した。

All the specimens met the requirements of PRS-2371.

Table 1 試験順序と試料数 / Test Sequence and Sample Quantity

試験項目 Test Item	グループ / Group												
	A	B	C	D	E	F	G	H	J	K	L	M	
接触抵抗 Contact Resistance	2,6		1,3,5	1,5	1,3	1,5	1,5,7	1,3	1,3				
絶縁抵抗 Insulation Resistance				2,6		2,6	2,8						
耐電圧 D. W. Voltage				3,7		3,7	3,9						
温度上昇 Temperature rising												1	
挿入力 Mating Force	1,5												
抜去力 Un-mating Force	3,7												
耐久性 Durability	4						4 (10cycles)						
端子保持力 Contact Retention Force		1,3											
ケーブル保持力 Cable Retention Force	8												
耐振動性 Vibration			2										
耐衝撃性 Shock			4										
熱衝撃 Thermal Shock				4									
高温寿命 High Temperature Life		2			2								
湿度 (定常状態) Humidity (Steady State)						4							
湿度 (サイクリング) Humidity (Cycling)							6						
塩水噴射 Salt Water Spray								2					
硫化水素ガス H2S Gas									2				
半田付け性 Solder ability										1			
半田耐熱性 Soldering Heat Resistance											1		
試料数 Specimen Quantity.	5 pcs.	20 pos.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 pcs.

※グループ表中の番号は、試験順序を示す。 / Numbers indicate sequence in which tests are performed.

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表 2-1. 試験結果 (Table.2-1 Test result)

試験項目 Test Item	測定内容 Measurements		規格 Spec.	Set	n	データ/DATA					判定 Judge	
						AVE.	MAX.	MIN.	s	X±3s		
A Group 耐久性 Durability ケーブル保持力 Cable Retention Force	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	560.884	567.01	553.27	2.751	569.137	OK	
		30 回挿抜後 After 30th Cycle	AWG #40 ΔR=40mΩMAX.			0.810	6.27	-5.82	2.298	7.704	OK	
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	21.320	22.82	20.27	0.813	23.759	OK	
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			-0.198	1.00	-0.84	0.568	1.506	OK	
	30P	挿入力 Mating Force (N)	初期 Initial	12.0N MAX.	5	5	7.725	8.06	7.43	0.256	8.493	OK
			30 回挿抜後 After 30th Cycle	12.0N MAX.			5.716	6.19	5.20	0.383	6.865	OK
		抜去力 Un-mating Force (N)	初期 Initial	1.80N MIN.	5	5	5.844	6.41	5.41	0.374	4.722	OK
			30 回挿抜後 After 30th Cycle	1.80N MIN.			4.876	5.25	4.67	0.235	4.171	OK
		ケーブル保持力 (Cable retention force)		11.80N MIN.	5	5	121.268	126.29	118.57	3.491	110.795	OK
	40P	挿入力 Mating Force (N)	初期 Initial	16.0N MAX.	5	5	8.512	8.75	8.18	0.208	9.136	OK
			30 回挿抜後 After 30th Cycle	16.0N MAX.			6.172	6.40	5.84	0.228	6.856	OK
		抜去力 Un-mating Force (N)	初期 Initial	2.40N MIN.	5	5	6.344	6.79	5.95	0.412	5.108	OK
			30 回挿抜後 After 30th Cycle	2.40N MIN.			5.124	5.40	4.77	0.258	4.350	OK
		ケーブル保持力 (Cable retention force)		12.40N MIN.	5	5	126.386	128.64	122.12	2.505	118.871	OK
B Group 端子保持力 Contact Retention Force	RECE	初期 Initial	0.20N MIN.	-	20	1.075	1.65	0.61	0.250	0.325	OK	
		高温試験後 After High Temperature Life	0.20N MIN.	-	20	1.060	1.66	0.71	0.248	0.316	OK	

表 2-2. 試験結果 (Table.2-2 Test result)

試験項目 Test Item	測定内容 Measurements		規格 Spec.	Set	n	データ/DATA					判定 Judge
						AVE.	MAX.	MIN.	s	X±3s	
C Group 振動 衝撃 Vibration & Shock	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	555.387	563.99	547.09	3.673	566.406	OK
		振動後 After Vibration	AWG #40 ΔR=40mΩMAX.			0.605	4.40	-3.50	1.612	5.441	OK
		衝撃後 After Shock				-0.832	3.42	-3.81	1.636	4.076	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	22.712	24.19	21.66	0.721	24.875	OK
		振動後 After Vibration	ΔR=40mΩMAX.			0.057	1.38	-1.62	0.820	2.517	OK
		衝撃後 After Shock				-0.198	2.05	-1.49	1.052	2.958	OK
	電気の瞬断 Electrical Discontinuity	振動試験中 During Vibration	1μsec. MAX.	5	5	瞬断無し No discontinuity					OK
		衝撃試験中 During Shock				瞬断無し No discontinuity					OK
	外観 Appearance	振動後 After Vibration	異常無き事 No abnormality	5	5	異常無し No abnormality					OK
		衝撃後 After Shock				異常無し No abnormality					OK
D Group 熱衝撃 Thermal Shock	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	550.394	566.99	530.97	8.857	576.965	OK
		試験後 After Testing	AWG #40 ΔR=40mΩMAX.			1.324	7.50	-5.92	2.667	9.325	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	22.828	24.95	21.85	0.931	25.621	OK
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			-0.342	0.18	-1.24	0.389	0.825	OK
	絶縁抵抗 Insulation Resistance (MΩ)	初期 Initial	1000MΩ MIN. 500MΩ MIN.	5	150	1.47×10 ⁵ MΩ MIN.					OK
		試験後 After Testing				1.01×10 ⁵ MΩ MIN.					OK
	耐電圧 D.W.Voltage	初期 Initial	異常無き事 No abnormality	5	150	異常無し No abnormality					OK
		試験後 After Testing				異常無し No abnormality					OK

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表 2-3. 試験結果 (Table.2-3 Test result)

試験項目 Test Item	測定内容 Measurements		規格 Spec.	Set	n	データ/DATA					判定 Judge
						AVE.	MAX.	MIN.	s	X±3s	
E Group 高温放置 High Temp. Life	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	556.560	564.82	548.69	3.174	566.082	OK
		試験後 After Testing	AWG #40 ΔR=40mΩMAX.			0.961	6.29	-4.99	2.100	7.261	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	22.565	24.47	20.13	1.287	26.426	OK
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			-0.314	1.49	-3.09	1.507	4.207	OK
F Group 湿度(定常) High Humidity Life	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	554.483	561.10	548.96	2.492	561.959	OK
		試験後 After Testing	AWG #40 ΔR=40mΩMAX.			0.544	6.43	-6.37	2.392	7.720	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	21.735	23.01	20.43	0.941	24.558	OK
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			0.516	1.29	-0.35	0.561	2.199	OK
	絶縁抵抗 Insulation Resistance (MΩ)	初期 Initial	1000MΩ MIN.	5	150	1.06×10 ⁵ MΩ MIN.					OK
		試験後 After Testing	500MΩ MIN.			1.03×10 ⁵ MΩ MIN.					OK
耐電圧 D.W.Voltage	初期 Initial	異常無き事 No abnormality	5	150	異常無し No abnormality					OK	
	試験後 After Testing	No abnormality			異常無し No abnormality					OK	
G Group 湿度(サイクル) High Humidity Life	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	562.447	569.57	555.49	2.535	570.052	OK
		試験後 After Testing	AWG #40 ΔR=40mΩMAX.			-0.028	2.85	-2.60	1.277	3.803	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	22.622	24.22	20.80	1.162	26.108	OK
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			0.985	1.87	0.50	0.437	2.296	OK
	絶縁抵抗 Insulation Resistance (MΩ)	初期 Initial	1000MΩ MIN.	5	150	2.29×10 ⁵ MΩ MIN.					OK
		試験後 After Testing	500MΩ MIN.			1.32×10 ⁵ MΩ MIN.					OK
	耐電圧 D.W.Voltage	初期 Initial	異常無き事 No abnormality	5	150	異常無し No abnormality					OK
		試験後 After Testing	No abnormality			異常無し No abnormality					OK

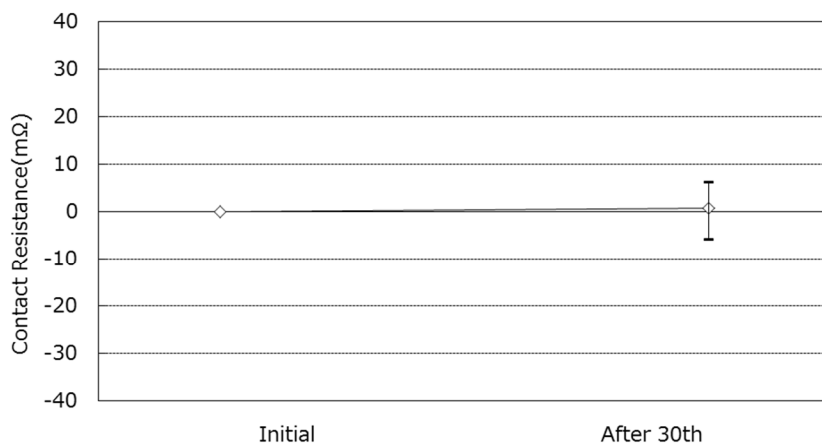
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表 2-4. 試験結果 (Table.2-4 Test result)

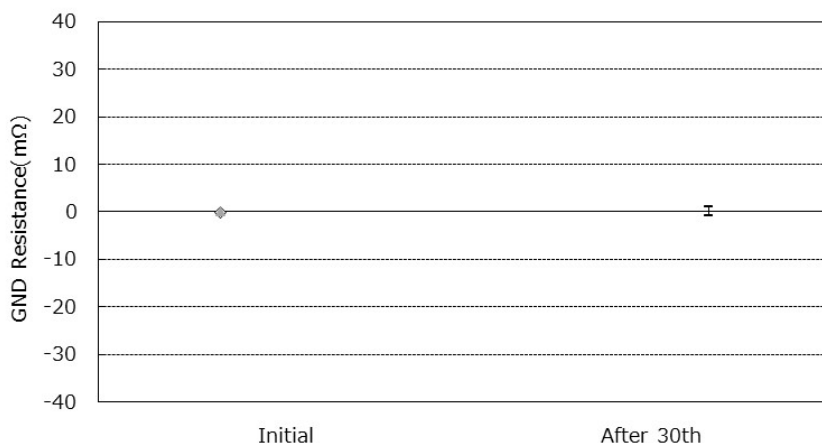
試験項目 Test Item	測定内容 Measurements		規格 Spec.	Set	n	データ/DATA					判定 Judge
						AVE.	MAX.	MIN.	s	X±3s	
H Group 塩水噴霧 Salt Water Spray	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	557.511	563.27	550.93	2.334	564.513	OK
		試験後 After Testing	AWG #40 ΔR=40mΩMAX.			0.440	6.22	-5.05	2.020	6.500	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	22.846	24.74	21.29	1.043	25.975	OK
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			-0.341	1.09	-3.21	1.643	4.588	OK
J Group ガス (H2S) GAS (H2S)	接触抵抗 Contact Resistance (mΩ)	初期 Initial	AWG #40 600mΩ MAX.	5	200	558.587	564.90	551.28	2.746	566.825	OK
		試験後 After Testing	AWG #40 ΔR=40mΩMAX.			1.463	6.89	-5.32	2.650	9.413	OK
	GND 抵抗 GND Resistance (mΩ)	初期 Initial	50mΩ MAX.	5	200	22.566	24.57	20.91	1.193	26.145	OK
		30 回挿抜後 After 30th Cycle	ΔR=40mΩMAX.			-0.536	0.61	-2.29	0.876	2.092	OK
K Group 半田耐熱性 Soldering Heat Resistance	外観 Appearance		異常無き事 No abnormality	10	10	異常無し No abnormality					OK
L Group 半田付け性 Solderability	外観 Appearance		フィレットが 形成されている事 (フィレット≤90度) Fillet is made (Fillet angle≤90°)	10	10	問題無し No problem					OK
M Group 温度上昇 Temperature Rise	AWG #40 0.30A/Pin (Total 7.80 A)		ΔT=30℃ MAX.	5	5	ΔT= 27.5℃ MAX.					OK

*温度上昇試験については、定格電流の 0.3A/Contact を隣接する 26 芯分 (コネクタ全体で 7.80A) 流した時の結果です。

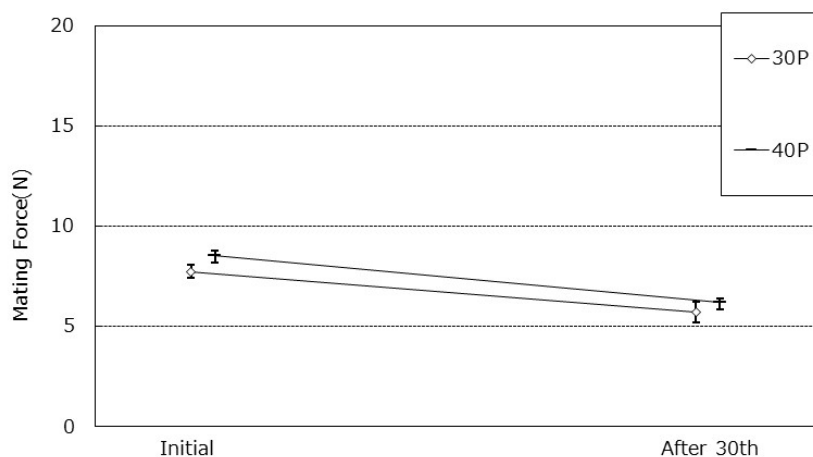
The Temperature Rising Test is a result when applied ratings current (0.3A/contact) between the neighboring contacts for 26pos. (With the whole connector 7.80A.)



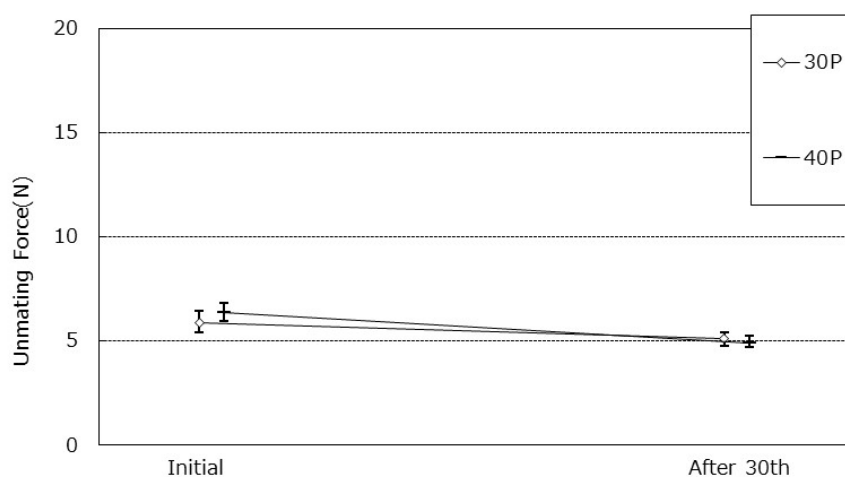
Graph1. 接触抵抗値の変化 (A Group : 耐久性)
A change of contact resistance (A Group:Durability)



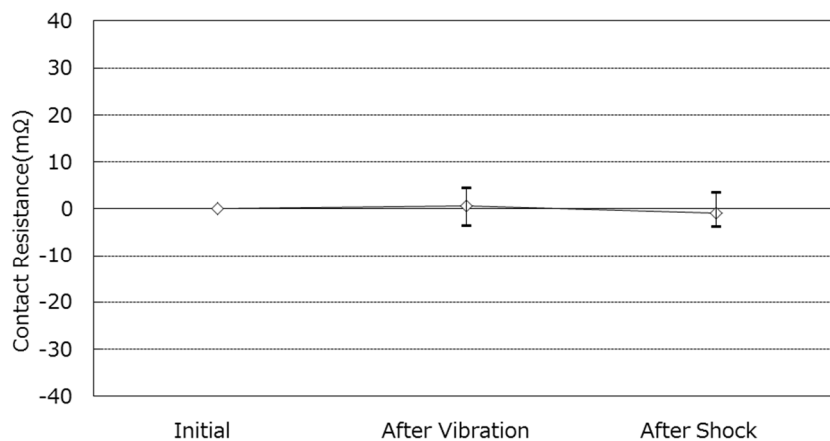
Graph2. GND抵抗値の変化 (A Group : 耐久性)
A change of GND resistance (A Group:Durability)



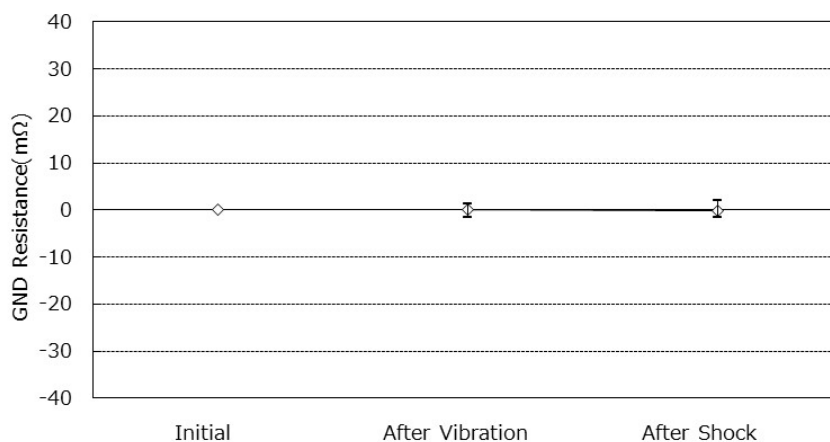
Graph3. 挿入力の変化 (A Group : 耐久性)
A change of mating force (A Group:Durability)



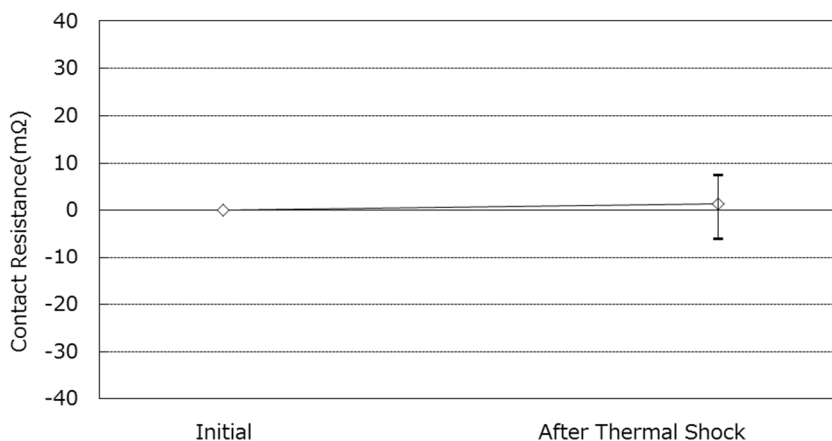
Graph4. 抜去力の変化 (A Group : 耐久性)
A change of ummating force (A Group:Durability)



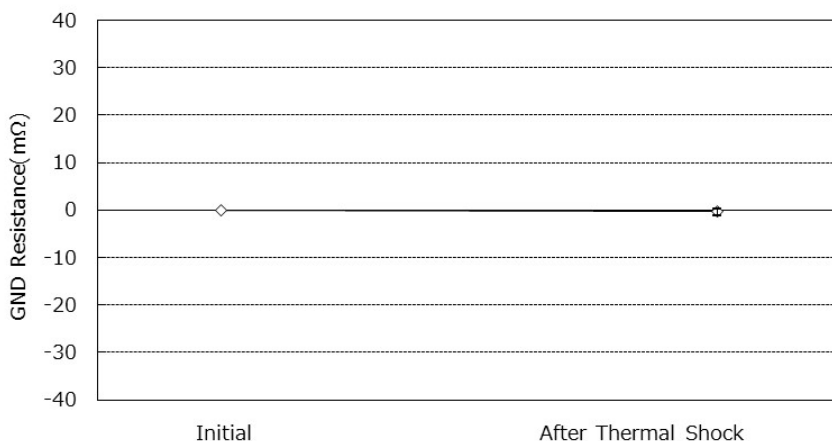
Graph5. 接触抵抗値の変化 (C Group : 振動衝撃)
A change of contact resistance (C Group:Vibration & Shock)



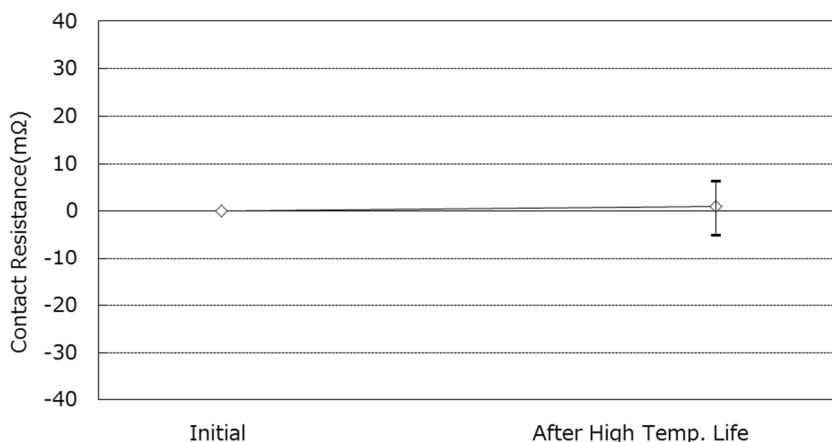
Graph6. GND抵抗値の変化 (C Group : 振動衝撃)
A change of GND resistance (C Group:Vibration & Shock)



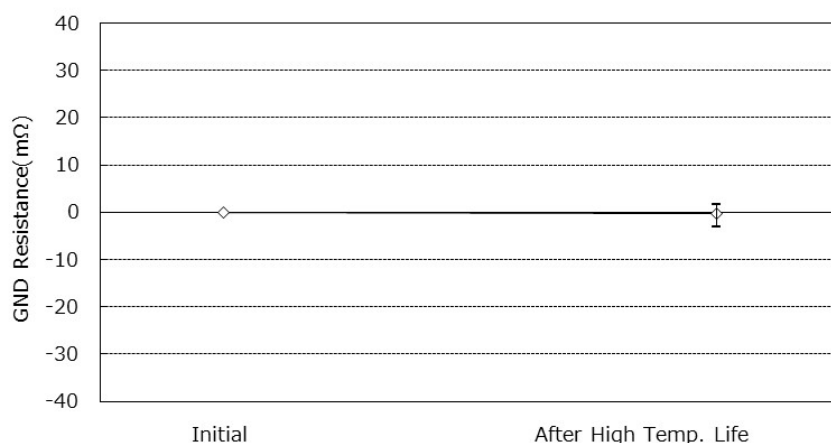
Initial After Thermal Shock
Graph7. 接触抵抗値の変化 (D Group : 熱衝撃)
 A change of contact resistance (D Group:Thermal Shock)



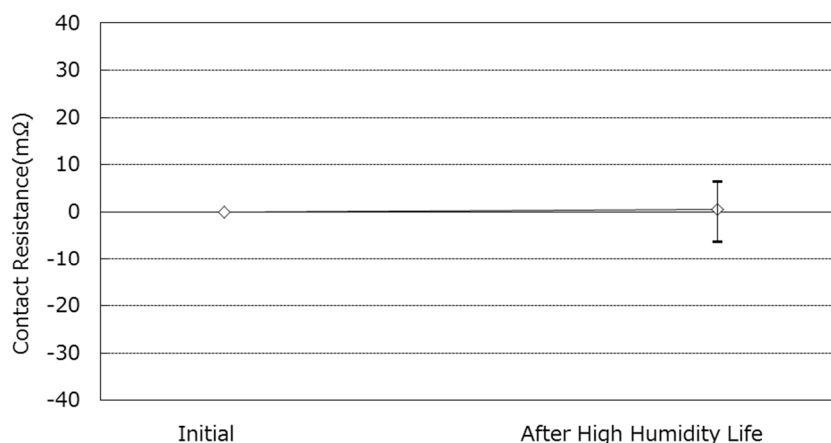
Initial After Thermal Shock
Graph8. GND抵抗値の変化 (D Group : 熱衝撃)
 A change of GND resistance (D Group:Thermal Shock)



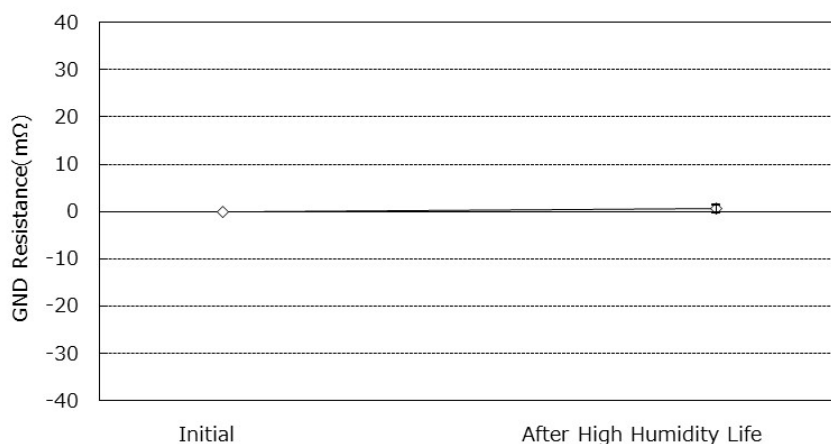
Initial After High Temp. Life
Graph9. 接触抵抗値の変化 (E Group : 高温放置)
 A change of contact resistance (E Group:High Temp. Life)



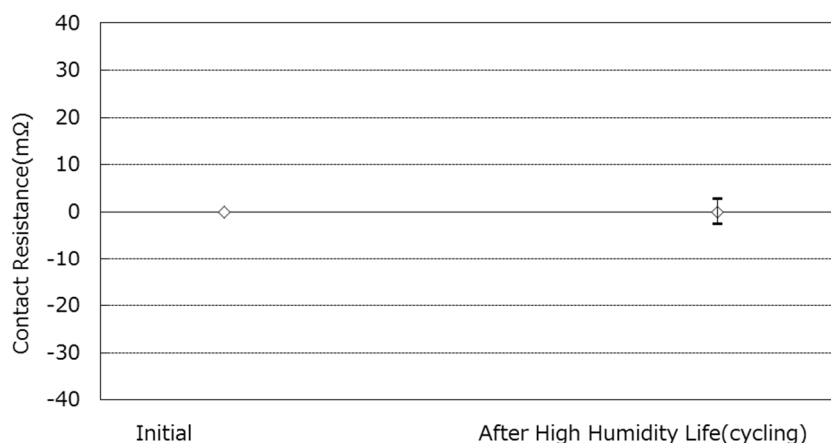
Initial After High Temp. Life
Graph10. GND抵抗値の変化 (E Group : 高温放置)
 A change of GND resistance (E Group:High Temp. Life)



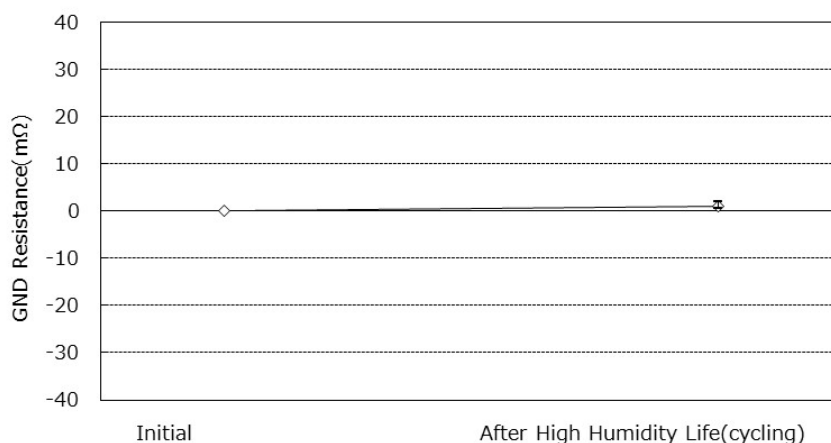
Initial After High Humidity Life
Graph11. 接触抵抗値の変化 (F Group : 湿度定常)
 A change of Contact resistance (F Group:High Humidity Life)



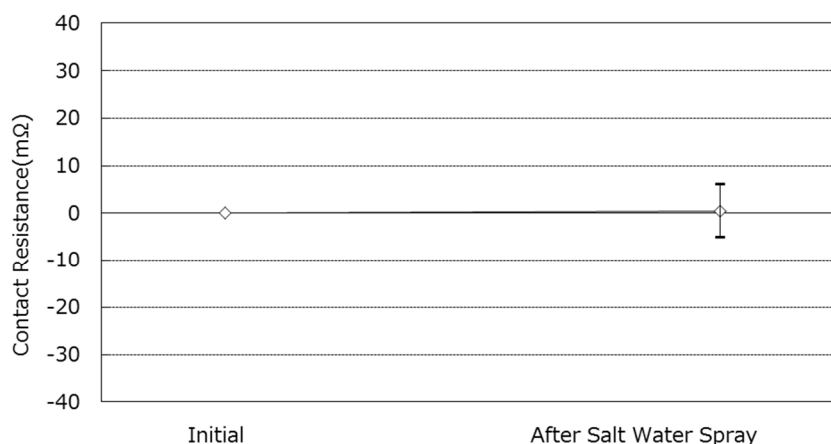
Initial After High Humidity Life
Graph12. GND抵抗値の変化 (F Group : 湿度定常)
 A change of GND resistance (F Group:High Humidity Life)



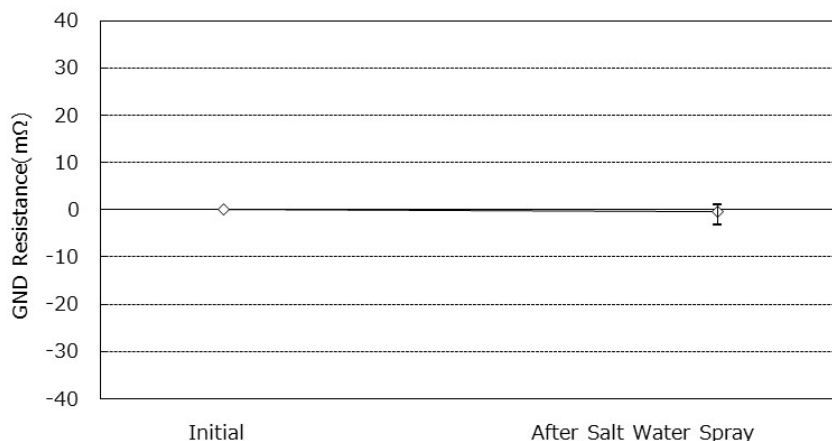
Graph13. 接触抵抗値の変化 (G Group : 湿度サイクル)
A change of contact resistance (G Group:High Humidity Life(cycling))



Graph14. GND抵抗値の変化 (G Group : 湿度サイクル)
A change of GND resistance (G Group:High Humidity Life(cycling))

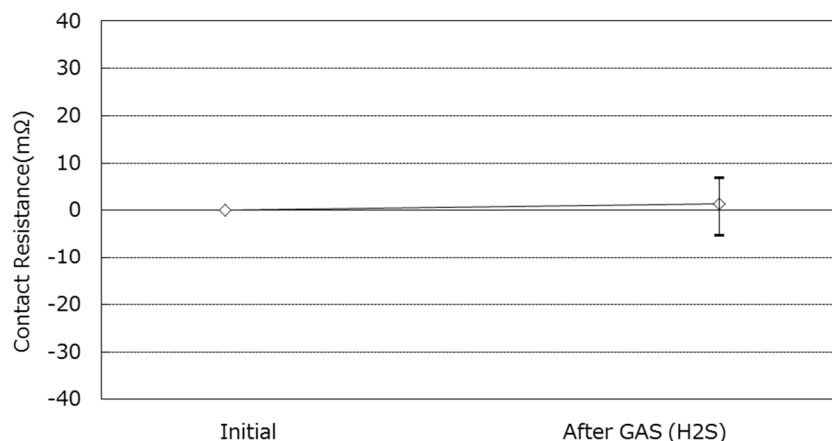


Graph15. 接触抵抗値の変化 (H Group : 塩水噴霧)
A change of contact resistance (H Group:Salt Water Spray)



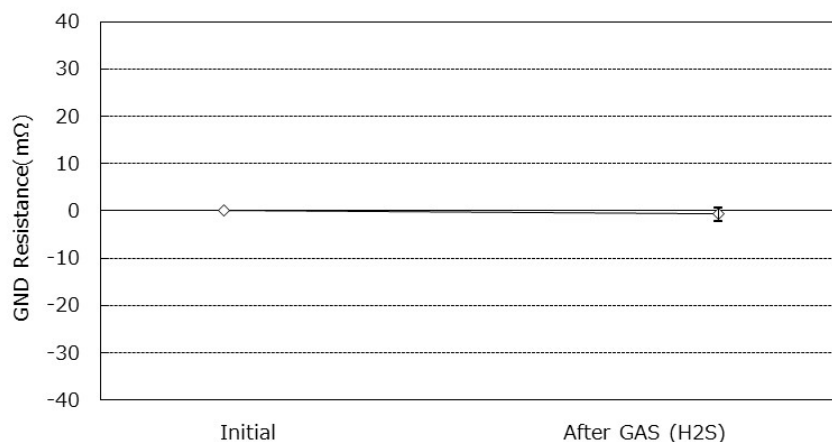
Initial After Salt Water Spray

Graph16. GND抵抗値の変化 (H Group : 塩水噴霧)
A change of GND resistance (H Group:Salt Water Spray)



Initial After GAS (H2S)

Graph17. 接触抵抗値の変化 (J Group : ガス (H2S))
A change of contact resistance (J Group:GAS (H2S))



Initial After GAS (H2S)

Graph18. GND抵抗値の変化 (J Group : ガス (H2S))
A change of GND resistance (J Group:GAS (H2S))